REGISTER

OF THE

TRUSTEES, OFFICERS AND STUDENTS

OF THE

LEHIGH UNIVERSITY,

SOUTH BETHLEHEM, PA.,

FOR THE YEAR 1876-77.

WITH THE PLAN OF ORGANIZATION AND COURSE OF INSTRUCTION.

TUITION FREE.

BETHLEHEM, PA.:
D. J. GODSHALK & CO., JOB PRINTERS.

1877.

CALENDAR.

1876-77.

1876.		
Sept. 6.	First term begins	Wednesday.
Nov. 30.	Thanksgiving Day	Thursday.
Dec. 21.	First term ends	Thursday.
1877.		
Jan. 12.	Second term begins	Friday.
Feb. 14.	Ash Wednesday	
Feb. 22.	Washington's Birthday	Tuesday.
Mar. 29.	Easter Holidays begin	Thursday.
April 2.	Easter Holidays end	Monday.
June 4.	Annual Examinations begin . . .	Monday.
June 14.	Prize Essays handed in	Thursday.
June 16-17.	Examinations for Admission . . .	
June 17.	University Sermon	Sunday.
June 20.	Reading of Theses	Wednesday.
June 21.	University Day	Thursday.

1877-78.

1877.		
Sept. 3-4.	Examinations for Admission . . .	
Sept. 5.	First term begins	Wednesday.
Nov. 29.	Thanksgiving Day	Thursday.
Dec. 22.	First term ends	Saturday.
1878.		
Jan. 12.	Second term begins	Saturday.

FOUNDED BY

ASA PACKER.

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The Lehigh University.

ORIGIN.

The Hon. Asa Packer of Mauch Chunk, during the year 1865, appropriated the sum of Five Hundred Thousand Dollars, to which he has since added one hundred and fifteen acres of land in South Bethlehem, to establish an educational institution in the rich and beautiful Valley of the Lehigh. From this foundation rose the Lehigh University.

DESIGN.

The original object of Judge Packer was to afford the young men of the Valley a complete technical education for those professions which had developed the peculiar resources of the surrounding region. Instruction was to be liberally provided in Civil, Mechanical and Mining Engineering; Chemistry, Metallurgy and Construction, and in all needful collateral studies. French and German were made important elements in the collegiate course. A School of General Literature was a part of the original plan, together with tuition in the ancient Classics, while the institution was freely opened to pupils from every part of the country and the world.

It is proposed, as soon as practicable, to establish various other technical professorships, and at the same time to develop and enlarge the Classical Department, and to have all the appointments of a complete University. Recently, Sunday service has been opened in the College Chapel, and Lectures on Psychology and the Christian Evidences are delivered by the President.

FREE TUITION.

It will be observed that all these educational facilities are provided without charge. Through the generosity of the Founder, the Trustees were enabled, in 1871, to declare tuition FREE in all branches and classes. The Lehigh University is open to young men of suitable talents and training from every part of our own land and of the world. We especially call to this fact the attention of the pupils of our public schools and of the graduates of classical institutions. Thus are offered, *without charge*, every facility for mastering the professions of the Civil, Mechanical and Mining Engineer, and of the Metallurgist and Analytical Chemist. Classical Instruction is also given to those who wish to become Lawyers, Clergymen, Physicians, Editors, or to pursue any distinctively literary avocation.

A CLASSICAL PROFESSORSHIP

Has recently been established by the Hon. Asa Packer.

PUBLIC WORSHIP.

Prayers are attended in the Chapel every morning, and all the students are required to be present.

Divine Service is held on every Sunday morning, according to the forms of the Protestant Episcopal Church, in the Chapel of the University. Attendance at this service is required of every student, except in case of those connected with other religious bodies, to whom the President will grant permission at the beginning of each term (if requested by the parent or guardian or by the student himself if he be 21 years of age) to attend during that term the place of worship of the body with which he is connected, where attendance on Sunday morning will in such cases be required.

SITE.

Nothing is wanting in the situation of the Institution. The salubrity of the climate and the beauty of the scenery cannot be surpassed. Situated in a region famous for its vast railway and

manufacturing enterprises, near some of the richest iron and coal mines in our land, accessible to the great mechanical works of New York and Philadelphia, the students have rare facilities for confirming the teachings of the recitation room by the observation of the eye.

COMMUNICATION.

The University Buildings are about a half-mile from the depot, at the junction of the Lehigh Valley and North Pennsylvania Railroads, thus affording communication with all sections of the country. New York is about ninety and Philadelphia fifty-four miles distant.

BUILDINGS.

Packer Hall, named after the Founder, stands seven hundred feet back of Packer Avenue, at the base of the Lehigh Mountain. Built of handsome stone, it presents to the north a noble and imposing front. At the western extremity is a belfry tower containing the President's Room and the Archive Room. The eastern end is a large advanced wing in which are Lecture and Recitation Rooms, and also a most extensive and complete Laboratory. The central portion, eighty feet long, contains the Chapel, Library and Cabinets. To the right, within the grounds, are the houses of the President and Professors, comporting architecturally with the great hall. Towards the north-eastern extremity stand Christmas Hall and Saucon Hall, commodious brick edifices, containing students' rooms, heated by steam and lighted by gas, and a mess hall. At the south-western extremity stands the Sayre Observatory, the gift of Robert H. Sayre, Esq., of South Bethlehem, containing an Equatorial and Zenith Telescope, Transit Instruments and Astronomical Clock.

EXPENSES.

As before stated, tuition is FREE in all branches and classes. Books, materials, paper, pencils, chemical materials used in the analytical laboratory, and instruments, are furnished by the student.

Rooms and board are provided in the University buildings under the following rules:

1. The amount of room-rent, board, &c., for each term, must be paid in advance to the Treasurer of the Executive Committee, who will furnish the student with board ticket and key of room.

2. The charge for board and room rent shall be $5 per week. Where two students occupy a room jointly, the charge shall be $4.50 per week for each.

3. The charge for board without room shall be $4 per week. The charge for room rent without board shall be $2 per week for each room.

4. These prices include gas and heat.

5. Meal tickets will be furnished by the steward to students or friends visiting them, at 50 cents each, payable in advance to the steward.

6. The choice of rooms shall be in the order of the classes; in any class the first applicant to have the first choice.

7. Students may retain their rooms from year to year by giving notice of their intention so to do at the close of the academic year, and by procuring their tickets therefor on or before the first day of the next term.

8. Students are required to keep their rooms in order, or to employ some proper person to do so for them.

9. No furniture for rooms will be provided by the University.

10. The use of kerosene, coal oil or burning fluid, in any of the buildings, is prohibited.

NOTE.—The whole club-expenses of the student need not exceed $3.50 per week.

DIPLOMAS AND CERTIFICATES.

The Diploma is given only to those who have passed through the regular course in the classes and one of the Schools. For all partial courses a certificate is given of what the student has accomplished.

The fee for the Diploma on graduation in any of the Schools is $10, payable before receiving it.

ADMISSION OF STUDENTS.

Applications for admission into the University should be made to the President, from whom all information may be obtained.

REGULAR STUDENTS.

All applicants for regular standing in the classes or schools must be prepared to pass an examination according to the programme of studies. From this it will be seen that a student may be admitted at any time if able to pass a satisfactory examination in the studies already pursued by his class. This examination will be rigid. The only exception will be in the case of any young man who is very nearly but not thoroughly prepared to enter in full standing in any class. Such an one may, at the discretion of the Faculty, be admitted conditionally, to make up his deficiencies by extra study under the care of a professor or instructor. When they are made up, he will be received in full standing in his class.

SPECIAL STUDENTS

May enter, selecting such studies as they please, upon a satisfactory examination, with the sanction of the Faculty.

REQUIREMENTS FOR ADMISSION.

Applicants for admission into the first class must be at least *sixteen* years of age, and must present testimonials of good moral character. They will be examined in the following subjects:

Mathematics.—Arithmetic complete, including metric system; Olney's complete School Algebra, or Davies' new Bourdon's Algebra, through equations of the second degree; first six books of Chauvenet's Geometry.

English.—Correct spelling, to be determined by writing from dictation in idiomatic English; Mitchell's School Geography; Parker's English Grammar; Mitchell's or Guyot's Physical Geography or equivalent.

For requirements for admission to School of General Literature see page 13.

GENERAL PLAN.

The courses and subjects of study are set forth and arranged in the following manner:

THE FIRST THREE TERMS—(One Year and a Half.)

These are devoted, by all regular students, to the study of those elementary branches in which every young man should be instructed, for whatever profession or business in life he may wish to prepare himself, viz.: Mathematics, Languages, Elementary Physics, Chemistry, Drawing, History, Rhetoric, Logic, Declamation and Composition.

At the end of this time, having acquired the necessary knowledge, the student, following the bent of his own mind, and aided by his parents and professors, will be ready to select some special professional course, to which all his studies and efforts will be directed. To enable him to do this, there are several technical schools which branch off from the end of the common course. In each the term of study is two and a half additional years, and the student at his graduation in one of them receives a special degree. By this means a young man is relieved from the oppressive and confusing study of those branches for which he has no taste, and pursues with cheerfulness the special course which he has selected, and for which he is suited by inclination and intelligence.

GENERAL COURSE.

STUDIES OF THE FRESHMAN CLASS.

First Term.

Mathematics.—Chauvenet's Geometry complete.
Physics.—Deschanel's Mechanics and Lectures.
English Studies.—Weber's Outlines of Universal History.

Essays written extemporaneously under the eye of the instructor. Declamations in the Chapel.

German.—Otto's Grammar, with Lectures. Writing in German letters. Translation of German into English.

Geometrical Drawing.—Warren's Drafting Instruments and Operations. Elements of Industrial Drawing.

Second Term.

Mathematics.—Olney's University Algebra, Part III.

Chemistry.—Lectures on the Principles of Chemistry. Inorganic: Fownes' Elementary Chemistry.

Drawing.—The use of the Pencil and Pen in Free Hand Drawing. Geometrical Drawing (Warren.)

English Studies.—Coppée's Elements of Rhetoric and Logic. Compositions carefully prepared. Declamations in the Chapel.

German.—Otto's Conversation Grammar, continued. Translations of English into German. Exercises in Conversation. Affinity of English and German.

STUDIES OF THE SOPHOMORE CLASS.

First Term.

Mathematics.—Plane and Spherical Trigonometry and Mensuration; use of Logarithmic Tables; Olney's General Geometry.

Chemistry.—Lectures on Chemistry, with Laboratory Practice.

Physics.—Heat and Meteorology, with practical work as in the U. S. Signal Service; Barometrical Levelling and Measurement of Heights; Magnetism and Statical Electricity.

English Literature.—Coppée's.

German.—Otto's German Conversation; Written Exercises; Prepared Conversation; Declamation.

THE SPECIAL SCHOOLS.

The following is presented as the general programme of instruction in these schools, subject to such modifications from time to time as the Faculty may deem expedient, with the approval of the Trustees.

REQUIREMENTS FOR ADMISSION.

Students who have passed successfully through the first three terms, may be admitted into any one of the Schools. All other applicants for admission into one of the Schools must pass a satisfactory examination on the subjects studied in the first three terms, and must be at least eighteen years of age.

I. THE SCHOOL OF GENERAL LITERATURE.

This School is intended to correspond, with certain important differences, to the course long established in our colleges; and is open to those who expect to enter upon the study of Law, Medicine or Divinity, or to such as desire a general, rather than a technical education.

It should be observed that those who expect to enter it at the period of divergence—the middle of the second year—are required to study Latin and Greek from the date of their entrance into the institution.

The study of Mathematics in this School embraces Algebra, Geometry, Trigonometry, Descriptive Geometry and Analytical Geometry, as further progress in this branch is not deemed essential to the objects of the School.

The programme includes the courses in Physics and Chemistry, and a course in Theoretical Mechanics.

There is also a full course in the Science of Language, and on the Origin and Growth of the English Language.

There are also courses in Psychology, International and Constitutional Law, Political Economy and Christian Evidences.

The study of English Literature is continued from the common

course, with readings from the principal English and American authors.

SCHOOL OF GENERAL LITERATURE.

Including the Ancient and Modern Classics.

REQUIREMENTS FOR ADMISSION.

Mathematics.—Arithmetic complete, including the Metric System. Olney's complete School Algebra, or Davies' new Bourdon's Algebra, through equations of the second degree. Chauvenet's Geometry, six books.

English.—Correct Spelling, to be determined by writing from dictation in Idiomatic English. Geography. English Grammar. Physical Geography.

Latin.—A thorough knowledge of Latin Grammar. Cæsar's Commentaries, four books. Virgil's Æneid, four books. Cicero's four Orations against Catiline.

Greek.—A thorough knowledge of Greek Grammar is required. Xenophon's Anabasis, four books. Homer's Iliad, four books.

FRESHMAN CLASS.

First Term.

Mathematics.—Chauvenet's Geometry (completed.)

Physics.—Deschanel's Mechanics, and Lectures.

English Studies.—Weber's Outlines of History. Essays written extemporaneously under the eye of the Instructor. Declamations in the Chapel.

Latin.—Livy: Books XXI. and XXII. Horace: Odes.

Greek —Herodotus' Persian Wars, or Homer's Odyssey. Latin and Greek Composition. Classic Mythology.

Second Term.

Mathematics.—Olney's University Algebra, Part III.

Chemistry.—Lectures on the Prineiples of Chemistry. Inorganic; Fownes' Elementary Chemistry.

English.—Rhetoric and Logic Compositions as in first term. Declamations in the Chapel.

Latin.—Cicero: De Senectute and de Amicitia. Latin Prosody.

Greek.—Xenophon's Memorabilia of Socrates, or Cyropædia. Greek and Roman Antiquities.

SOPHOMORE CLASS.

First Term.

Mathematics.—Plane and Spherical Trigonometry and Mensuration. Use of Logarithmic tables: Olney's General Geometry.

Chemistry.—Lectures.

English.—Coppée's English Literature.

Physics.—Heat; Meteorology; Barometrical Levelling and measurement of Heights; Magnetism and Statical Electricity.

Latin.—Tacitus; Agricola.

Greek.—Demosthenes' Philippics, or the Universal History of Polybius.

Second Term.

History.—History of England. (The Student's Hume.)

English.—Composition and Declamation.

Physics.—Galvanism; Acoustics; Light.

French.—Fasquelle's French Course. Reading: Robinson's Dialogues. Pieces for Declamations.

Latin.—Horace: Satires and Epistles.

Greek.—Euripides; Medea or Alcestis.

JUNIOR CLASS.

First Term.

English.—Lectures on the Science of Language: Müller and Farrar. Lectures on the English Language: Schele de Vere.

Mathematics.—Descriptive Geometry.

French.—Fasquelle's: Syntax, with written exercises. Collo-

quial exercises. De Lille: Condensed Freneh Construetion. Dialogues and pieees for Reeitation.

Latin.—Taeitus: Annals.

Greek.—Plato's Gorgias.

Second Term.

English.—Leetures on the Philosphy of History.

French.—Poitevin: Grammaire Elémentaire (in Freneh.) Written Exereises. Deelamations: Choix de Poésie par Jules Ponsard.

Latin.—Satires of Juvenal.

Greek.—Thueydides.

Mineralogy.—Dana's Manual.

SENIOR CLASS.

First Term.

Psychology.—Lectures.

History.—History of France (in Freneh.)

Political Economy.—Perry's.

International Law.—Leetures.

French.—Poitevin: Grammaire Elémentaire, Syntax(in Freneh) Composition; Conversation.

Latin.—Horaee: Ars Poetica, or the Adelphi of Terenee.

Geology.—Leetures.

Astronomy.—Loomis' Treatise on Astronomy, with Lectures.

Second Term.

Christian Evidences.—Leetures.

Constitutional Law.—Lectures.

French.—Systematic Classieal Readings. Composition: Lectures on Freneh Literature.

Greek and Latin.—Demosthenes' and Æschines' de Corona, or Æsehylus' PrometheusVinetus. Review of Latin and Greek authors.

Geology.—Lectures.

II. THE SCHOOL OF CIVIL (OR STATICAL) ENGINEERING.

The general scope of this School comprises the higher branches of the applied mechanics and mathematics, together with the principles of construction and exercises in mapping, drawing and designing. Thus, the student is made acquainted with the Theory of Elasticity or Flexure, including the strength of materials, the principles of construction of roof-trusses, beams, girders and bridges, as well as the practical designing of such structures, the determination of their proper dimensions and the preparation of working drawings. Under this head belongs also the Theory of the Stability of Structures, including the theory of the arch and the construction of retaining walls; together with the Theory of Motion as applied to machines; the principles of Hydrostatics and Hydraulics with their applications to water pressure engines, over-shot, under-shot and breast wheels, turbines, etc.

In all cases practical examples, such as occur in actual engineering practice, are taken up and discussed, and, together with the analytical or algebraic methods, the student is also instructed in practical graphical solutions of the various problems, wherever such solutions present a special value in practice. Much time is devoted to geodetical operations and to actual practice and instruction in the Field. Profiles, Plans of Trigonometrical Surveys, Contour Maps and Town Surveys are made. Instruction is given in the practical operations connected with the reconnoissance, location and surveys of roads, canals and railroads, such as cross-sectioning, setting grade stakes, laying out of curves and calculation of excavation and embankment. Thorough instruction is given in Drawing, the construction of working drawings of structures, the designing of bridges and roofs, topography and hydrographical charts.

Attention is also paid to the *application* of the general principles of the science of Engineering, or to Engineering considered as an *art*. Under this latter head may be classed the composition and qualities of materials used in construction, iron, steel, wood, stone; their dressing and preservation; foundations, earth and rock-work; harbor and river improvements, drainage, collection and distribution of water, grading, paving, etc.

So much of Mechanical Engineering is necessarily included, as

refers to the construction of bridges and canal locks, etc., and the special machinery and appliances used in the erection of structures.

Designs for, and reviews of, special structures, specifications and estimates of quantities and cost, and the preparation of a graduation Thesis giving evidence of satisfactory attainments, complete the course. The graduate of this School will receive the degree of C. E. (Civil Engineer.)

Graduates of the School of Civil Engineering, by remaining one year and pursuing the course of studies elsewhere laid down, may receive the degree of Mechanical Engineer (M. E.)

SCHOOL OF STATICAL ENGINEERING.

SOPHOMORE CLASS.

Second Term.

Mathematics.—Differential and Integral Calculus.

Physics.—Galvanism, Acoustics, Light.

French.—As in School of General Literature.

Descriptive Geometry.—General Orthographic Projections.

Drawing.—Elementary Topographical Drawing: Maps of Farm Surveys.

Surveying.—Chain and Compass Surveying—Theory and Practice. Farm Surveys.

JUNIOR CLASS.

First Term.

Mathematics.—Integral Calculus.

Mechanics.—Smith's. Mathematical Theory of Motion; Science of Motion in general; Statics; Dynamics and Statics of Fluids; Lectures on Theory of Centre of Gravity and Moment of Inertia.

Descriptive Geometry.—Warped Surfaces; Shades and Shadows, Linear Perspective.

French.—French Composition, and a course to enable the student to read Scientific French Works.

Crystallography.—Lectures.

Surveying.—Use and Adjustment of Field Instruments; Levelling; Triangulation; Topographical Surveying; Hydrography; Theory and Practice.

Topographical Drawing.—Profiles; Plans of Trigonometrical Surveys; Contour Maps; Elements of Machine Drawing.

Second Term.

Applied Mechanics.—Theory of Strains (Stoney;) Lectures.

Mineralogy.—Descriptive and Determinative, with practice.

Stereotomy.—Elements of Machine Drawing; Drawings of Structures; Working Drawings.

Surveying.—Surveying with Plane Table; Mine Surveying; Town Surveying; Theory and Practice.

Topographical Drawing.—Colored Topography; Hydrographical Charts; Plans and Profiles of Mines; Town Maps.

SENIOR CLASS.

First Term.

Applied Mechanics.—Theory of Flexure; Elasticity and Strength of Materials, including Forms of Uniform Strength; Stability of Structures; Theory of the Arch; Retaining Walls. Graphical Statics; Graphical Solutions of Statical Problems.

Psychology.—Lectures by the President.

Astronomy.—Descriptive Astronomy.

Geology.—Lithology, with practical exercises in the determination of rocks.

Stereotomy.—Stone Cutting; Working Drawings.

International Law.—Lectures.

Surveying.—Theory of Reconnoissance; Preliminary and Location Surveys for Roads, Railroads, Canals; Henck's Field Book for Railroad Engineers; Preliminary Field Practice in Staking out

Curves, Sidings, etc.; Field Work of the Location; Cross Sectioning; Setting Grade Stakes; Calculation of Earth Work; Final Estimates; Map and Profile of Location.

Second Term.

Applied Mechanics.—Theory of Trussed Frames; Bridges and Roofs; General Theory of Machines; Principles of Thermodynamics and Theory of the Steam Engine; Hydraulics and Hydraulic Motors.

Construction.—Materials of Structures; Dressing and Preservation of Materials; Foundations, Roofs, Bridges and Culverts; Construction of Roads, Railroads, Canals and Tunnels; Earth and Rock Work; Harbor and River Improvements; Farm and Town Drainage; Collection and Distribution of Water; Designs for and Reviews of Special Structures.

Christian Evidences.—Lectures by the President.

Constitutional Law.—Lectures.

Astronomy.—Practical Astronomy as applied to Geodesy and Navigation. Lectures and Observatory work. Determination of Latitude and Longitude. Practice with the Sextant.

SCHOOL OF STATICAL ENGINEERING.

(Post Graduate Course for Mechanical Engineers.)

First Term.

Stereotomy.—Stone Cutting; Working Drawings.

Descriptive Geometry.—As in Junior year.

Drawing.—Topographical—as in Junior year.

Stereotomy.—Drawings of Structures; Working Drawings.

Second Term.

Construction.—As in Senior year.

Surveying.—As in Senior year.

Drawing.—Topographical, as in Junior year; Reviews of, and Designs for, Special Structures.

Study of special topics throughout the year, under the direction of the Professor.

Preparation of Theses.

III. THE SCHOOL OF MECHANICAL (OR DYNAMICAL) ENGINEERING.

While the problems which the Civil Engineer is called upon to solve are mainly *statical* problems, involving the idea of rest or equilibrium, and the ends to be obtained in his constructions are stiffness, rigidity and immobility; the object of the Mechanical or Dynamical Engineer, on the other hand, is not to avoid or prevent, but to *cause* motion, not to oppose the action of the forces of nature but so to guide and use them as to obtain the desired results in the best manner and with the least expenditure of force and material. The two sciences are thus, in the nature of the problems with which they have to do, to a certain extent antithetical. The sciences, however, of which both make use, and the fundamental principles, by the application of which the desired results are in each case obtained, are, to a considerable extent, identical.

Thus, the higher branches of the mathematics and of applied mechanics, as well as the principles of constructions, are common to both Schools. So also as regards the Theory of Elasticity or Flexure and the Strength and Properties of Materials. Much, therefore, of the course as already indicated for the School of Civil Engineering, finds here also a place, as will appear from an examination of the more detailed course of study which is elsewhere given.

In the practical *application* of the principles common to both, however, the two Schools diverge. Thus special attention is directed to the applications of the principles of mechanics to machinery, in the construction of stationary, locomotive and marine engines, hydraulic motors of various kinds, blast furnaces and their appurtenances, foundries, rolling-mills and steel works. Information is afforded of the methods of casting and working in iron and other metals, and of making and using the tools employed in these processes.

Much attention is paid to the execution of working drawings, and to the Theory of Mechanism. The proximity of numerous blast furnaces, rolling mills, foundries, machine shops and factories,

enables the student to see the practical workings of such establishments and to obtain valuable practical information in the various branches of mechanical engineering.

Visits of inspection to the workshops, mills and blast furnaces in the neighborhood, with explanations of the machinery and tools used, form an important feature of the course.

The graduate in this School will receive the degree of Mechanical Engineer (M. E.)

Graduates of the School of Mechanical Engineering, by remaining an additional year and pursuing the course of studies elsewhere laid down, may receive the degree of Civil Engineer (C. E.)

THE SCHOOL OF MECHANICAL (OR DYNAMICAL) ENGINEERING.

SOPHOMORE CLASS.

Second Term.

Mathematics.—Differential and Integral Calculus.
Physics.—Galvanism; Acoustics; Light.
French.—As in Civil Engineering School.
Descriptive Geometry.—General Orthographic Projections.
Blow-pipe Analysis.—Lectures with Practice.
Surveying.—As in Civil Engineering School.

JUNIOR CLASS.

First Term.

Mathematics.—Integral Calculus.
Mechanics.—As in Civil Engineering School.
Crystallography.—Lectures.
Stereotomy.—Warren's Machine Drawing, Theory and Plates; Sketches and Working Drawings of parts of Machinery.
French.—As in Civil Engineering School.
Surveying.—As in Civil Engineering School.

Second Term.

Applied Mechanics.—As in Civil Engineering School.

Mineralogy and Geology.—Economic Geology.

Metallurgy.—Special Metallurgy, as in School of Mining Engineering.

Principles of Mechanism.—Willis.

Machine Drawing.—Sketches of Complete Machines; Working Drawings of Simple Machines; Finished and Working Drawings of Special Machines; Construction of Machines from actual measurements.

Practical Mechanism.—Lectures in the Workshop; Machine Tools; Planing; Turning, etc. (Shelley, Pole, Bourne.)

SENIOR CLASS.

First Term.

Applied Mechanics.—Theory of Flexure; Elasticity and Strength of Materials; Theory of the Arch; Retaining Walls; Graphical Statics; Graphical Solutions of Statical Problems.

Astronomy.—Descriptive Astronomy; Observatory Practice.

Geology.—Lectures.

Psychology.—Lectures by the President.

International Law.—Lectures.

Practical Mechanism.—Lectures on Forging, Riveting; Pattern Making and Moulding, with Practice in the Workshop; Visits of Inspection.

Second Term.

Applied Mechanics.—Principles of Thermodynamics and Theory of the Steam Engine; Hydraulics and Hydraulic Motors.

Theory of Mechanism.—Link and Valve Motion (Zenner;) General Theory of Machines (Reauleaux.)

Machines.—Hydraulic Engines; Steam Engines; Air Engines; Boilers, their Construction, Strength and Safety; Foundry, Machine Shop, Rolling Mill and Bessemer Plants; Designs for and Reviews of Special Machines.

Christian Evidences.—Lectures by the President.

Constitutional Law.—Lectures.

Practical Mechanism.—Setting up and Fitting; Lectures.

Machine Drawing.—Finished and Working Drawings of Special Machines.

SCHOOL OF MECHANICAL ENGINEERING.

(Post Graduate Course for Civil Engineers.)

First Term.

Crystallography.—As in Junior year.

Stereotomy.—Machine Drawing.

Mechanics.—Principles of Mechanism.

Practical Mechanism.—As in Junior and Senior years.

Second Term.

Metallurgy and Mineralogy.—As in Junior year.

Stereotomy.—Machine Drawing; Finished and Working Drawings of Special Machines.

Practical Mechanism.—As in Senior year.

Machines.—As in Senior year.

Study of Special Topics throughout the year, under the direction of the Professor.

Preparation of Theses.

IV. THE SCHOOL OF MINING AND METALLURGY.

The full course in this School comprises, besides the Mathematical, Physical, Chemical and Literary studies necessary to all technical education, courses in Mining, Metallurgy, Geology, Mineralogy, Machines, qualitative and quantitative Analysis, Assaying, Blowpipe Analysis, Topographical and Mine Surveying and Drawing. On account of the great number and scope of the studies necessary to the completion of the full course, it is four years and a half in length.

The graduate in this School, who has taken the full course, will receive the degree of E. M. (Engineer of Mines.)

A partial course may be taken in this School by those who wish to pursue the study of Metallurgy. The course of Metallurgy includes the studies of the full course, except those of Mining and Surveying. More time is devoted to Chemical Analysis and Machines than in the full course. The length of the course is four years.

The graduate of this School in the Metallurgical course will receive the degree of Metallurgist. (Metallt.)

A Post Graduate course has been arranged in this School, comprising courses in Mining, Metallurgy, Chemical Analysis and Blow-pipe Analysis, with supplemental courses in Geology and Mineralogy.

Graduates in the School of Civil Engineering, by remaining one year and taking this course, may obtain the degree of E. M.

In the courses of Mineralogy, Geology and Analytical Chemistry, much attention is paid to the practical instruction of the student in determining minerals by their crystallographical and physical properties, and by the aid of blow-pipe analysis, in the determination of rocks; in the qualitative and quantitative examination of ores and metallurgical products, and in the rapid methods of assaying ores by the dry and wet ways employed in metallurgical laboratories. The vicinity to the iron works of the Lehigh Valley and especially to the works of the Bethlehem Iron Company, with its blast furnaces, foundry and machine shops, and Bessemer, puddle, iron and steel rail mills, affords unusual facilities for the practical study of iron metallurgy. The processes of the manufacture of spelter and oxide of zinc may be studied at the works of the Lehigh Zinc Company. The facilities for the practical study of mining and economic geology are hardly less great. The mines of the Lehigh Zinc Company and the brown hematite and slate deposits of the Lehigh Valley are in the immediate vicinity, while within easy reach by rail are the anthracite coal fields of Pennsylvania, the iron and zinc mines of New Jersey, and the celebrated iron mines at Cornwall, Pa.

THE SCHOOL OF MINING AND METALLURGY.

SOPHOMORE CLASS.

Second Term.

Mathematics.—Differential and Integral Calculus.
Physics.—Galvanism, Acoustics and Light.
French.—As in School of Civil Engineering.
English Literature.—Lectures.
Descriptive Geometry.—General Orthographic Projection.
Blow-Pipe Analysis.—Lectures and Practice.

JUNIOR CLASS.

First Term.

Mechanics—As in School of Civil Engineering.
French.—As in School of Civil Engineering.
Mineralogy.—Lectures on Crystallography, with Practical Exercises in the Determination of Crystals.
Topographical Drawing.—Contour Map.
Machine Drawing.—Warren's Machine Drawing, Theory and Plates; Sketches and Working Drawing of Parts of Machinery.
Surveying.—As in School of Civil Engineering.

Second Term.

Applied Mechanics.—As in School of Civil Engineering.
Metallurgy.—Metallurgical Processes, Furnaces; Refractory Building Materials; Combustion; Natural and Artificial Fuels; Metallurgy of Iron.
Mineralogy.—Descriptive Mineralogy, with Practical Exercises in the Determination of Minerals.
Chemistry.—Assaying; Laboratory Work.
Blow-Pipe Analysis.—Practice.
Surveying.—As in School of Civil Engineering.

SENIOR CLASS.

First Term.

Applied Mechanics.—As in School of Civil Engineering.

Geology.—Lithology, with Practical Exercises in the Determination of Rocks.

Metallurgy.—Of Copper, Lead, Silver, Gold, Platinum, Mercury, Tin, Zinc, Nickel, Cobalt, Arsenic, Antimony and Bismuth.

Chemistry.—Quantitative Analysis; Laboratory Work.

Psychology.—Lectures by the President.

International Law.—Lectures.

Second Term.

Mining.—Modes of Occurrence of the Useful Minerals; Searching for Mineral Deposits; Examination of Mining Properties; Boring; Mining Tools, Machines and Processes; Timbering and Masonry; Methods of Exploitation.

Geology.—Historic, Dynamic and Economic Geology.

Chemistry.—Quantitative Analysis; Laboratory Work.

Machines.—Theory of the Steam Engine.

Applied Mechanics.—As in School of Civil Engineering.

Christian Evidences.—Lectures by the President.

Constitutional Law.—Lectures.

FIFTH YEAR.

First Term.

Mining.—Underground Transportation; Hoisting; Drainage and Pumping; Ventilation and Lighting; Mechanical Preparation of Ores; Coal Washing.

Chemistry.—Quantitative Analysis.

Machines.—Theory of Machines.

Astronomy.—Descriptive Astronomy.

V. THE SCHOOL OF MINING AND METALLURGY.

(Metallurgical Course.)

SOPHOMORE CLASS.

Second Term.

Mathematics,
Physics,
English Literature,
French,
Blow-Pipe Analysis,
Descriptive Geometry,
} As in full course.

JUNIOR CLASS.

First Term.

Mechanics,
French,
Mineralogy,
Machine Drawing,
} As in full course.

Machines.—Theory of Mechanism.

Second Term.

Applied Mechanics,
Metallurgy,
Mineralogy,
Assaying,
Blow-Pipe Analysis,
Quantitative Analysis,
Machine Drawing,
} As in full course

SENIOR CLASS.

First Term.

Applied Mechanics,
Geology,
Metallurgy,
Chemistry,
Psychology,
International Law,
} As in full course.

Second Term.

Applied Mechanics,
Machines,
Geology,
Chemistry,
Christian Evidences,
} As in full course.

Constitutional Law.—Lectures.

Drawing.—Machine Drawing, Details of Metallurgical Apparatus.

THE SCHOOL OF MINING AND METALLURGY.

(Post Graduate Course in Civil Engineering.)

First Term.

Metallurgy.—Special Metallurgy of all useful metals except iron as in the first term of the Senior Class of the full course in Mining and Metallurgy.

Mining.—As in the first term of the fifth year of the full course.

Mineralogy.—Practice in the Determination of Crystals.

Chemistry.—Quantitative Analysis.

Second Term.

Mining.—As in the second term of the Senior year in the full course.

Metallurgy.—General Metallurgy; Metallurgy of Iron as in the second term of the Junior year of the full course.

Geology.—Economic Geology.

Blow-Pipe Analysis.—Practice.

Chemistry.—Quantitative Analysis, Laboratory Work; Assaying; Volumetric Analysis.

VI. THE SCHOOL OF CHEMISTRY.

The course of instruction in this School continues the subject of Theoretical Chemistry from the general course of the two previous terms, the subjects of Chemical Philosophy and Organic Chemis-

try being taught by daily recitations until the close of the Junior year.

In Analytical Chemistry, the course of Quantitative Analysis in the first term of the second year is followed by preparation of Chemical Compounds and the Purification of Chemicals.

Subsequently, Quantitative Analysis is pursued to the end of the course, including the Dry Assaying of Ores of Gold, Silver, Copper, Lead, Iron and Tin, and the Wet Analyses, included in the appended schedule. In addition, courses of Lectures on Medical, Agricultural and Technical Chemistry are given, and various industrial establishments in the neighborhood and in Philadelphia are visited, in the company of an instructor. The course also includes thorough instruction in Physics and Mechanics, Mineralogy and Blow-Pipe Analysis, Metallurgy, Geology and Descriptive Astronomy, together with courses of Lectures on Psychology, Christian Evidences and International Law.

The last term of the Senior year is mainly devoted to the preparation of a Thesis on some subject, selected by the Professor, involving practical work in the Laboratory, in addition to the literary labor, and each graduate will thus make a contribution to the progress of the science as a preliminary to the reception of his degree.

The course is thus seen to include thorough instruction in theoretical and applied chemistry, in their various branches, as well as in those cognate and other sciences of such great value to the chemist.

The Laboratories are under the immediate charge of the Professor and his Assistant, and, together with the lecture-room, are unsurpassed in excellence by any similar establishment in the country, being supplied with all the modern improvements. The collections of apparatus, specimens and models, illustrating theoretical and applied chemistry, are already important and rapidly increasing.

Students are charged for the chemicals and apparatus consumed. If the student is moderately careful, this expense need not exceed $50 per year.

The graduate in this School will receive the degree of A. C. (Analytical Chemist.)

THE SCHOOL OF CHEMISTRY.

SOPHOMORE CLASS.

Second Term.

Mathematics, Physics and French.—Same as in School of Civil Engineering.

Chemical Preparations.—Including the Preparation of Chemical Compounds and the Purification of Chemicals by Distillation, Sublimation, Fusion, Crystallization, Precipitation, etc.

Assaying.—Including the Assay by the Dry Methods of Gold, Silver, Copper, Lead, Iron and Tin Ores.

Blow-Pipe Analysis.—Practice.

JUNIOR CLASS.

First Term.

Descriptive Geometry and French.—As in School of Engineering.

Astronomy.—As in School of General Literature.

Crystallography.—

CHEMISTRY.

Chemical Philosophy.—Cooke's Chemical Philosophy.

Toxicology.—Otto on Poisons.

Quantitative Analysis.—Fresenius' Quantitative Analysis. The following analyses are executed by the students:

1. Iron Wire (Fe.)
2. Potassic Dichromate (Cr_2O_3.)
3. Baric Chloride (Ba. Cl. H_2O.)
4. Magnesic Sulphate (MgO. SO_3. H_2O.)
5. Hydro Di-Sodic Phosphate (P_2O_5.)
6. Bronze (Cu. Sn. Zn.)
7. Rochelle Salt (K_2O. Na_2O.)
8. Volumetric Determination of Chlorine.
9. Acidimetry (HCl. H_2SO_4. HNO_3.)
10. Alkalimetry (KOH. NaOH. NH_4OH.)

11. Chlorimetry (Bleaching Powders.)
12. Silver Coin (Au. Ag. Pb. Cu.)
13. Zinc Ore (Zn.)

Second Term.

Mineralogy.—
Metallurgy.—

CHEMISTRY.

Quantitative Analysis. — Fresenius' Quantitative Analysis. The following analyses are executed by the students.

14. Copper Ore (Cu.)
15. Spiegeleisen (Mn.)
16. Lead Ore (Pb. S.)
17. Ilmenite (TiO_2.)
18. Iron Ore (Complete Analysis.)
19. Limestone (Complete Analysis.)
20. Coal (Volatile Matter,—Fixed Carbon, Ash, H_2O, S., P.)
21. Slag (Complete Analysis.)

Chemical Philosophy.—Cooke's Chemical Philosophy.

SENIOR CLASS.

First Term.

Geology.—Dana's.
Psychology.—Lectures by the President.
International Law.—Lectures.

CHEMISTRY.

Quantitative Analysis. — Fresenius' Quantitative Analysis. The following analyses are executed by the students:

22. Guano (NH_3. P_2O_5. H_2O.)
23. Clay (Complete Analysis.)
24. Manganese Ore (MnO_2.)
25. Mineral Water (Complete Analysis.)
26. Pig Iron (Complete Analysis.)
27. Nickel Ore (Ni. Co.)
28. Organic Analysis (C. H. O. N.)
29. Gas Analysis (Complete Analysis of Illuminating Gas.)

Organic Chemistry.—Wöhler's Organic Chemistry.
Constitutional Law.—Lectures.

Second Term.

Geology.—Dana's.
Chemistry Applied to the Arts.—Lectures.
Medical Chemistry.—Lectures.
Agricultural Chemistry.—Lectures.
Christian Evidences.—Lectures by the President.
Preparation of Theses.

PROGRAMME OF STUDIES.

SHOWING THE NUMBER OF HOURS AND EXERCISES PER WEEK DEVOTED TO EACH SUBJECT.

In the following Programme of Studies the number of Exercises per week in each subject is indicated by the figure in parenthesis immediately following.

Two hours of Drawing, three of work in the Laboratory, or three of practice in the field are regarded as equivalent to a recitation or lecture of one hour's duration.

GENERAL COURSE.

FRESHMAN CLASS.

First Term.

Geometry and Mensuration (5), History (3), Essays (1), German (4), Lectures on Chemical Physics (2), Elementary Drawing and Use of Instruments (3).

Second Term.

Algebra (5), Rhetoric and Logic (2), Essays (1), Chemistry (Lectures) (3), German (4), Drawing (3).

SOPHOMORE CLASS.

First Term.

Mathematics (5), Chemistry (Lectures) (4), Chemistry (Work in Laboratory) (2), Physics (3), German (2).

SPECIAL SCHOOLS.

Students who have passed successfully through the General Course, may be admitted into any of the Schools. All other applicants for admission into any of the Schools must pass a satisfactory examination in the subjects included in the General Course.

SCHOOL OF GENERAL LITERATURE.

SOPHOMORE CLASS.

Second Term.

English Literature (4), Physics (5), History (Text and Lectures) (4), German (2), French (3), Greek (4), Latin (2), Descriptive Geometry (3).

JUNIOR CLASS.

First Term.

The Science of Language (3), Lectures on the English Language (1), German (3), French (2), Greek (4), Latin (2).

Second Term.

Literature (3), Philosophy of History (Lectures) (2), Mineralogy (1), German (3), French (3), Greek (3), Latin (3).

SENIOR CLASS.

First Term.

Psychology (2), International Law (2), Descriptive Astronomy (3), Geology (2), German (2), French (2), Greek (2), Latin (2).

Second Term.

Christian Evidences (2), Political Economy (1), Constitutional Law (1), Physiology (1), Geology (2), French (2), German (2), Greek (2), Latin (3).

NOTE. – In the Senior Class, Latin and Greek are elective studies, and the alternates are Italian and Spanish.

SCHOOL OF CIVIL ENGINEERING.

SOPHOMORE CLASS.

Second Term.

Differential and Integral Calculus (4), Physics (5), French (3), Topographical Drawing and Map of Farm Survey (3), Descriptive Geometry (3).

JUNIOR CLASS.

First Term.

Adjustments of Instruments and Field Work (Theory and Practice) (3). Integral Calculus (2), Mechanics (5), French (4), Crystallography (Theory) (1), Drawing (Topographical) (2), Descriptive Geometry (3).

Second Term.

Topographical Drawing (4), Mineralogy (Theory and Practice) (3), Drawing (Hydrographical and Town Maps) (2), Structure and Machine Drawing (3), Applied Mechanics (2), Surveying (2).

SENIOR CLASS.

First Term.

Applied Mechanics (5), Stone Cutting (Theory and Plates) (2), Psychology (2), International Law (1), Descriptive Astronomy (3), Geology (3), Surveying (4).

Second Term.

Steam Engine (2), Applied Mechanics and Constructions (5), Christian Evidences (2), Road Engineering and Descriptive Constructions (2), Stone Cutting (2), Geology (2), Practical Astronomy (2), Constitutional Law (1).

NOTE.—By taking an additional year, graduates in the School of Civil Engineering may take the degree of Mining Engineer also, by going successfully through the following course:

POST GRADUATE COURSE FOR CIVIL ENGINEERS.

First Term.

Metallurgy (4), Mining (4), Quantitative Analysis (Laboratory Work) (8), Crystallography (1).

Second Term.

Metallurgy (3), Mining (3), Economic Geology (1), Blow-Pipe Analysis (2), Quantitative Analysis, Assaying, (Laboratory) (8).

SCHOOL OF MECHANICAL ENGINEERING.

SOPHOMORE CLASS.

Second Term.

Differential and Integral Calculus (4), Physics (5), French (3), Blow-Pipe Analysis (1), Descriptive Geometry (3), Surveying (3).

JUNIOR CLASS.

First Term.

Integral Calculus (2), Mechanics (5), French (4), Crystallography (1), Machine Drawing (2), Adjustments of Instruments and Field Work (3).

Second Term.

Applied Mechanics (2), Mineralogy (Theory and Practice) (3), Metallurgy (3), Practical Mechanism (1), Machine Drawing (4), Theory of Mechanism (3).

SENIOR CLASS.

First Term.

Applied Mechanics (5), Psychology (2), International Law (1), Descriptive Astronomy (3), Geology (3), Theory of Mechanism (2), Practical Mechanics (1).

Second Term.

Applied Mechanics (5), Theory of Steam Engine (2), Geology (2), Theory of Mechanism (2), Practical Mechanism (1), Practical Astronomy (2), Machine Drawing (1), Christian Evidences (2), Constitutional Law (1).

SCHOOL OF MINING AND METALLURGY.

SOPHOMORE CLASS.

Second Term.

Differential and Integral Calculus(4), Physics (5), French (3), Blow-Pipe Analysis (1), Descriptive Geometry (3).

JUNIOR CLASS.

First Term.

Mechanics (5), French (4), Crystallography (2), Surveying (3), Contour Map (1), Machine Drawing (2).

Second Term.

Applied Mechanics (2), Mineralogy (3), Metallurgy (3), Blow-Pipe Analysis (1), Assaying (3), Surveying (2).

SENIOR CLASS.

First Term.

Applied Mechanics (5), Geology (3), Metallurgy (4), Quantitative Analysis (Laboratory) (3), Psychology (2), International Law (1).

Second Term.

Mining (3), Geology (3), Economic Geology (1), Applied Mechanics (5), Machines (2), Quantitative Analysis (Laboratory) (3), Christian Evidences (2), Constitutional Law (1).

FIFTH YEAR.

First Term.

Mining (4), Theory of Mechanism (2), Descriptive Astronomy (3), Quantitative Analysis (Laboratory) (3).

SCHOOL OF MINING AND METALLURGY.—(METALLURGICAL COURSE.)

SOPHOMORE CLASS.

Second Term.

Differential and Integral Calculus (4), Physics (5), English Literature (2), French (3), Blow-Pipe Analysis (1), Descriptive Geometry (3).

JUNIOR CLASS.

First Term.

Mechanics (5), French (4), Crystallography (2), Machine Drawing (2), Quantitative Analysis (Laboratory) (3).

Second Term.

Applied Mechanics (2), Mineralogy (3), Metallurgy (3), Blow-Pipe Analysis (1), Assaying (3), Machine Drawing (4).

SENIOR CLASS.

First Term.

Applied Mechanics (5), Geology (3), Metallurgy (4), Quantitative Analysis (Laboratory) (3), Psychology (2), International Law (1).

Second Term.

Applied Mechanics (5), Theory of Mechanism (2), Theory of Steam Engine (2), Geology (2), Economic Geology (1), Quantitative Analysis (Laboratory) (3), Christian Evidences (2).

SCHOOL OF CHEMISTRY.

SOPHOMORE CLASS.

Second Term.

Physics (5), French (3), Pharmaceutical Chemistry (Laboratory) (2), Assaying (Laboratory) (3), Blow-Pipe Analysis (1), Drawing (Technical) (1), Descriptive Geometry (Theory and Plates) (3).

JUNIOR CLASS.

First Term.

Descriptive Geometry (3), Crystallography (Theory and Practice) (2), French (4), Chemical Philosophy (5), Quantitative Analysis (Laboratory) (5).

Second Term.

Mineralogy (Theory and Practice) (3), Metallurgy(3), Chemical Philosophy(5), Quantitative Analysis (Laboratory) (5).

SENIOR CLASS.

First Term.

Psychology (2), Descriptive Astronomy (3), Geology (3), Organic Chemistry (5), International Law (1), QuantitativeAnalysis (Laboratory) (10).

Second Term.

Geology (3), Medical Chemistry (1), Agricultural Chemistry (1), Chemistry Applied to the Arts (3), Christian Evidences (2), Quantitative Analysis (Laboratory) (10), Constitutional Law (1).

OBSERVATORY.

By the liberality of Robert H. Sayre, Esq., one of the Trustees of the University, an Astronomical Observatory has been erected on the University grounds, and placed under the charge of the Professor of Mathematics and Astronomy.

In the dome of the Observatory is mounted an Equatorial Telescope, of six inches aperture, by Alvan Clark & Sons. The west wing contains a superior Sidereal Clock, by Wm. Bond & Sons; a Zenith Telescope by Blunt, and a Field Transit by Stackpole. There is also a Prismatic Sextant, by Pistor & Martins.

Students in practical Astronomy receive instruction in the use of the instruments and in actual observation.

The grounds upon which the Observatory stands, consisting of seven acres of land adjoining the original grant, were presented to the University by Charles Brodhead, Esq , of Bethlehem.

An advanced course in Astronomy and the higher Analysis has been established, requiring two years for its completion.

It is adapted to the attainments of the graduates of this University, but is open to any one who may be prepared to pursue it.

This course embraces the following subjects:

First Year—Spherical Astronomy. Theory of Instruments. Method of least Squares. Numerical Calculus.

Second Year—Celestial Mechanics. Interpolation and Quadrature. Computation of Orbits and Perturbations.

During the entire course, the student will have ample opportunity to familiarize himself with the practical work of the Observatory and Computing Room.

SOCIETIES.

THE CHEMICAL AND NATURAL HISTORY SOCIETY OF THE LEHIGH UNIVERSITY.

This Society was organized in the Fall of 1871, as "The Chemical Society," but was afterwards expanded, as its present title indicates, and admits, by election, students from all departments of the University. The Reading Room is well supplied with scientific periodicals, including eighteen of the principal English and American journals.

The collections of Chemical Preparations, and of Botanical and Zoölogical Specimens belonging to the Society, are already important. During the past years persons have been sent to Texas and Brazil to collect specimens for these cabinets.

The Society has organized and maintained several courses of public scientific lectures.

Among the honorary members of the Society are more than one hundred of the most distinguished scientists in Europe and the United States.

THE ENGINEERING SOCIETY.

This Society, established and organized in February, 1873, under the auspices of the then Professor of Engineering, is designed especially for the benefit of students in Civil, Mechanical and Mining Engineering.

In its collection of photographs and details, Mechanical Engineering is well represented by Locomotives, Machines and Tools; Civil Engineering by Bridges, Aqueducts, &c., while the section of

Mining and Metallurgy is designed to be completely illustrated by mining and metallurgical plant. Meetings are held twiee a month, when subjects on Engineering and other seientific topies are discussed.

GRADUATING THESES.

Every student, in eaeh of the Schools, will be required to present a written essay or thesis upon some topic conneeted with his special School, as a necessary portion of the exereises for his final examination for a diploma. These essays shall be aceompanied by drawings and diagrams, when the subject needs sueh illustration. The originals will be kept by the University, as a part of the student's reeord, for future referenee; but a copy may be retained by the student, and be published, permission being first obtained from the President.

UNIVERSITY DAY AND EXHIBITIONS.

The day following the close of the Annual Examination shall be know as UNIVERSITY DAY. Upon this day the "Annual Exhibition of Graduates" shall take place in the presenee of the Trustees, Faculty and invited guests. The exercises shall consist of orations by members of the Senior Class. Every student must perform the duty assigned to him, unless exeused by the President.

THESIS DAY.

On the day preceding University Day, the Theses will be publiely read by the graduating students.

The University Sermon will be preaehed on the Sunday before University Day, under the direction of the President.

RESIDENT GRADUATES.

A limited number of graduates who desire to pursue their studies under the direetion of the Faculty, may be allowed the use of

the Library, and may attend the lectures in any of the Departments. Although not bound by University hours, they will be required to obey the directions of the President and of the Professors in reference to their departments, and will have their names placed upon the Annual Register.

PRIZE TO BE AWARDED IN 1877.

A Gold Medal for the best essay in the Sophomore Class. Subject: "*The Lehigh Valley.*" This medal is the gift of Charles Brodhead, Esq., and was established in 1868. The medal was awarded in 1875 to Thos. G. Budington of Brooklyn, L. I., and in 1876 to H. F. J. Porter of Morristown, N. J.

AWARD ON UNIVERSITY DAY.

The Wilbur Scholarship (value $200) was awarded in 1876 to L. J. Barr of the Sophomore Class. This Scholarship, founded in 1872, by E. P. Wilbur, Esq., of South Bethlehem, is awarded annually to that student of the Sophomore Class having the best record.

THE UNIVERSITY SERMON

Was preached in the University Chapel on Sunday, June 18th, by the President.

GRADUATING THESES OF THE CLASS OF 1876

Were read on Wednesday morning, June 21st, at 8:30 o'clock, as follows:

IN MINING ENGINEERING.

1. Mechanical vs Hand Puddling, with a Review of Seller's Rotary Puddler.
   E. H. Williams, Jr., B. A.

In Civil Engineering.

2. Review of Forty-first Street Bridge, over Pa. R. R. at Philadelphia.
F. C. Angle.

2. General Theory of Retaining Walls.
W. B. Baldy.

3. General Sewerage Question.
J. D. Carson.

4. Foundation Works of Kansas City Bridge.
Frank Gilman, B. A.

5. Turbines—Their Theoretical Calculation Compared with Results Deduced from Experiment.
W. Griffith.

6. Draw Span of Bridge over Ohio River, at Cincinnati.
C. W. Macfarlane.

7. An Examination of some important forms occurring in Bridge Construction, together with a Review of the International Bridge at Buffalo, N. Y.
R. W. Mahon.

8. Review of Cleveland Viaduct, with Calculations for the Draw Span.
W. P. Rice.

In Mechanical Engineering.

1. Review of Compound Marine Engines of U. S. Sloop-of-War "Ranger."
T. W. Frederick.

2. Review of Four-and-Half Sugar Cane Mill.
J. J. Gama Malcher.

3. Review of Compound Engine at Bethlehem Iron Works.
L. W. Richards.

IN ANALYTICAL CHEMISTRY.

1. On the Ocherous Deposit at Moosehead, Pa.
Levan Dannenhauer.

2. On the Disposition of Phosphorus in Iron Smelting by Blast Furnaces.
Frank Johnston.

The graduating Theses of the students in Mining and Metallurgy of the Class of 1876, were read in December, 1876, as follows:

1. Review of Blast Furnace Plant, at Stanhope, N. J.,
By Henry Richards.

2. Review of Copper Smelting Works at Phœnixville. Pa., and of the Hunt & Douglass Wet Process for the Extraction of Copper as applied at the works of the Chemical Copper Company at Phœnixville, Pa.,
By Charles L. Taylor.

STUDENTS.

C. E.—Civil Engineering. M. E.—Mechanical Engineering.
E. M.—Engineer of Mines. A. C.—Analytical Chemistry.
G. L.—General Literature.

POST GRADUATES.

Name.	School.	Address.	Univ. Res.
C. W. Macfarlane,	C.E., E. M.	Philadelphia,	Market street.

PASSED SENIORS.*

Henry Richards,	E. M.,	Dover, N. J.,	Fourth st.
Charles L. Taylor,	E. M.,	Philadelphia,	Fourth st.

SENIOR CLASS.

George G. Converse,	A.C. (Special)	Zanesville, O.,	Market st.
John Eagley,	C. E.,	Springfield,	Third st.
Percival Giess,	C. E.,	W. Bethlehem,	Broad st.
Andrew M. Glassell,	C. E. (Special)	Bowling Green, Va.	23 Saucon H.
George M. Heller,	C. E. (Special)	Philadelphia,	24 Saucon H.
Henry S. Jacoby,	C. E.,	Springtown,	Broad st.
Seizo Miyahara,	C. E.,	Kagoshima, Japan,	Market st.
M. Joseph Nowlan,	A. C. (Special)	Philadelphia,	New st.
Frederick D. Owen,	C. E. (Special)	Hartford, Conn.,	17 Saucon H.
Charles R. Rauch,	A. C.,	Bethlehem,	Bethlehem.
A. W. Sterner,	A. C. (Special)	Bursonville,	Rittersville.
Fred. M. Warner,	A. C. (Special)	Jersey City, N.J.	25 Saucon H.
Lewis T. Wolle,	C. E.,	Bethlehem,	New st.

*Course four and a half years.

JUNIOR CLASS.

Name.	School.	Address.	Univ. Res.
Lester J. Barr,	C. E ,	Erie,	21 Saucon II.
Charles Bull,	M. E ,	Buffalo, N Y.,	Fourth st.
Henry M. Bylles by,	M. E.,	Roselle, N.J.,	26 Saucon II.
John W Eckert,	A. C. (Special)	Allentown,	Allentown.
Andrew F. Freis,	C. E.,	West Point, N.Y.,	31 Saucon II.
James E. Gilbert,	C. E.,	Winchester, Va.,	27 Saucon II.
William S. Hazlett,	M. E.,	Zanesville, O.,	Birch st.
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